



Amendments to the Claims

This listing of the claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended): An X-ray microscopic inspection apparatus having X-ray generating means for generating an X-ray by allowing an electron beam from an electron source to impinge on a target for X-ray generation, for inspecting an object ~~to be inspected~~ by utilizing said X-ray, said X-ray microscopic inspection apparatus comprising: ~~a magnetic superposition lens having a magnetic field generating portion disposed in the vicinity of an electron generating portion of an electron gun, as a component element of said X-ray generating means~~

a field emission electron gun having an ultra-high vacuum electron gun chamber, an anode and an electron generating portion, wherein the electron generating portion is adapted to generate electrons and said anode is adapted to generate an electric field to accelerate said electrons;

said field emission electron gun further comprising a magnetic superposition lens including a magnetic circuit and a magnetic field generating portion, wherein said magnetic field generating portion is disposed separately from said ultra-high vacuum electron gun chamber and said magnetic superposition lens is adapted to generate a magnetic field,

wherein said electron generating portion is disposed in said magnetic field and said magnetic field is superposed to said electric field thereby reducing the loss amount of said electron beams from said electron source by focusing the accelerated electrons prior to being impinged on said target for X-ray generation.

2. (currently amended): ~~An~~ The X-ray microscopic inspection apparatus according to Claim 1, wherein having X-ray generating means for generating an X-ray by allowing an electron beam from an electron source to impinge on a target for X-ray generation, for inspecting an object ~~to be inspected~~ by utilizing said X-ray, said X-ray microscopic

~~inspection apparatus comprising the electron source is a liquid metal electron source using utilizing liquid metal as said electron source, as a component element of said X-ray generating means.~~

3. (currently amended): An The X-ray microscopic inspection apparatus according to Claim 1, wherein ~~having X-ray generating means for generating an X-ray by allowing an electron beam from an electron source to impinge on a target for X-ray generation, for inspecting an object to be inspected by utilizing said X-ray, said X-ray microscopic inspection apparatus comprising the electron source is a thermal field emission electron source as said electron source, as a component element of said X-ray generating means.~~

4. (currently amended): An The X-ray microscopic inspection apparatus according to Claim 1, wherein ~~having X-ray generating means for generating an X-ray by allowing an electron beam from an electron source to impinge on a target for X-ray generation, for inspecting an object to be inspected by utilizing said X-ray, said X-ray microscopic inspection apparatus comprising the target for X-ray generation is a target with a heat sink using thin CVD diamond plate as the heat sink as said target for X-ray generation, as a component element of said X-ray generating means.~~

5. (canceled)

6. (new): The X-ray microscopic inspection apparatus according to Claim 1, wherein the electron gun chamber of ultra-high vacuum is covered by the magnetic circuit.

7. (new): The X-ray microscopic inspection apparatus according to Claim 1, wherein the electron gun chamber is formed in the convex form, a section of the magnetic body of the magnetic generation portion is formed in a concaved form, and the electron generating portion of the electron gun is disposed in said concaved portion to that said electron generating portion and said magnetic generating portion become more close.

8. (new): The X-ray microscopic inspection apparatus according to Claim 1, wherein an accelerating voltage applied to the electron gun is within the range of 10 to 20 kV, and the focused electron beam is impinged to the target for the X-ray generation composed of germanium or chromium so that a characteristic X-ray having a wavelength of 0.2 to 3 nm.

9. (new): The X-ray microscopic inspection apparatus according to Claim 1, further comprising an electron lens disposed between the magnetic superposition lens and the target so that the electron beam is focused by two stages through said magnetic superposition lens and said electron lens.